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Willingness to Pay and Entrepreneurial Prospect of Estate Landscaping in the Tamale Metropolis in the Northern Region of Ghana

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ABSTRACT
Land degradation considerably reduces productivity of land base upon which the well-being of humanity depends and this significantly affects quality of water, food, air and climate. Aside its aesthetic value, landscaping is one of the ways of reducing environmental degradation. This paper evaluates entrepreneurial prospect of estate landscaping in the Tamale Metropolis by assessing the profitability, clients' willingness to pay and constraints of the landscape business. The purposive and snowball sampling techniques were used to select ten (10) landscape service providers, ten (10) commercial/institutional landscape clients and eighty (80) domestic landscape clients in the study area for the interview. Despite high production cost, landscape service providers have high net income. Though inefficient, the benefit-cost ratio showed that landscaping business in Tamale Metropolis is profitable. In general, willingness of landscape clients to pay more for landscape services is very high in the Metropolis. Since commercial/institutional clients of landscape services are more likely to be highly financially resourced, more commercial/institutional clients are willing to pay the higher bids for all the landscape services than domestic/household clients. Majority (92.5%) of both commercial/institutional and domestic clients are willing to pay more for establishment of new lawns and flower beds. Poor climatic condition was ranked as the topmost constraint, followed by inadequate capital and low public interest in landscaping. The study recommends that NGOs, private agencies and District Assembly should promote landscaping as a business in the metropolis. Individuals seeking for entrepreneurial opportunities should take advantage of the existing demand for landscape services in the Metropolis.

Key words: estate landscaping, entrepreneurial prospect, willingness to pay, contingent valuation method, profitability, marketing efficiency and Tamale Metropolis.

INTRODUCTION

Land and environmental degradations have direct negative impact on the world's poorest and most vulnerable communities (Dasgupta *et al*., 2005). Landscaping is one of the ways of reducing environmental degradation. Landscaping refers to the visible features of an area of land in terms of its aesthetic value. It encompasses the development of the aesthetic nature of a place by enhancing ornamental features, improving contours or by planting trees.

Although the use of plants and other elements to beautify the environment is the main aim of the landscape developer, the functional purposes of landscaping cannot be overemphasized. Landscaping creates a better atmosphere for learning and can increase market value of properties and tourism. For example, hotels situated in great sceneries attract many guests. Landscaping can be used to conserve most of the national resources and the entire environment. Trees could be used to modify temperature and serve as windbreak. Noise and glare viewing is reduced in a well landscaped area. Other benefits landscaping returns to the society are carbon sequestration, drinking water filtration, soil and water conservation, improved soil productivity, control of soil erosion and improved biodiversity conservation, among many others (Verdone, 2015; Morandin *et al*., 2015). Due to its importance, Campbell (2007) indicated that improvement in rural landscaping is very crucial to the conservation of rural environments. Verbič and Erker (2007) also mentioned that landscapes have distinct characteristics of international importance.

Over the last two decades, population explosion and rising incomes levels has awakened the consciousness of urban dwellers in Ghana that pleasant surrounding contributes to the well-being of individuals. Private estate developers, hotels and hospitality operators are increasing becoming aware of the importance of landscaping of their external environment. Landscape practice as a service industry employs both professionals (skilled) and non-professional (non-skilled) personals (Asiedu *et al*., 2010). According to Asiedu *et al*.(2010), practices such as planting, mowing, trimming, weed control are largely done by non-skilled labourers, whereas services such as planning, design, construction and management require the services of professionals. Landscape planning and installation as not been fully integrated into land use system in Ghana because farmers land-use decision and practices are still largely based on direct economic returns rather than environmental and social concerns such as biodiversity enhancement and ecosystem service benefits (Jackson

et al., 2007; Pascual and Perrings, 2007). As a result, there is poor adoption of agri-environment and biodiversity enhancement incentives by landowners and farmers (Carvalheiro *et al*., 2011; Brodt *et al*., 2009; Burton *et al*., 2008; Griffiths *et al.,* 2008). Evaluation of economic returns to landscape service providers in Ghana would help in understanding the pricing mechanism for landscape practices and provide insight into the challenges confronting the landscape industry.

When the market for a certain good is sufficiently competitive, economic activities can be studied through the market-pricing mechanism. Since this is usually not feasible in the case of environmental goods with an embodied natural and cultural heritage, particular methods for economic valuation of such goods have to be applied (Verbič and Erker, 2007). In the past decades, there has been a steady and marked development of the contribution of agriculture to supply positive externalities (Cicia and Scarpa, 2000). Many researchers have attempted to value agricultural landscape by mainly placing a price on it over the last few years (Johns *et al*., 2008). Only stated preference methods such as Contingent Valuation Method (CVM) (Verbič, 2006; Laitila and Paulrud, 2006; Venkatachalam, 2004) can be used to estimate environmental values such as landscape appearance, biotic diversity and preservation of cultural heritage and art collections, artefacts and monuments (Verbič and Erker, 2007).

Though landscaping has the potential of reducing both land degradation and unemployment in Ghana, it has not been given the necessary attention. To unearthing the entrepreneurial opportunities in agriculture, this study evaluates the entrepreneurial prospects of landscaping in the Tamale Metropolis, by using the Contingent Valuation Method (CVM) to estimate clients' Willingness to pay (WTP) for landscape services in the Tamale Metropolis of Ghana. In CVM, clients are allowed to indicate their value for both use and non-use of a product, giving a preference technique. It simulates a market for non-market goods and obtains a value for that good, contingent on a hypothetical market described during the survey. According to Owusu and Anifori (2013), consumers are allowed to value the product contingent on the market in order to solicit their WTP. The CVM estimates the premium that consumers are willing to pay above the prevailing market price for the product in the case where the price for the product already exists. Researchers such as Majumdar *et al*. (2011); Sumukwo *et al*. (2012);

Anaman and Lellyet (1996) have used CVM in diverse ways to estimate the value of resources in their studies.

One major hindrance to landscaping and its accurate valuation is that most landscape architects fail to provide full details of the cost estimation since majority of them do not make this part of their design process. Due to the lack of technical expertise especially in the local construction market coupled with the relatively large amount of time needed to assemble accurate detailed cost estimation, majority of landscape architects are unable to accurately value their services to their clients (Dell'losa, 2003). These landscape architects may rely on other, potentially untrusted, sources for cost estimates which either leads to overestimation or underestimation.

The objectives of the study therefore were to identify some of the entrepreneurial opportunities in agriculture, to assess the profitability of landscaping, consumers' willingness to pay for landscaping and constraints of landscape business development in the Tamale Metropolis.

METHODOLOGY

Site location, soil type, rainfall pattern and humidity

The experimental site was located in the interior Guinea savannah zone of Ghana at an altitude of 183m at latitude 9° 25''N and longitude 0°58''W of the equator. The soil type is sandy loam textured developed from the Voltaian sandstone known as the Nyankpala series. The area receives a unimodal rainfall pattern with mean annual amount of 1000-1200 mm which is usually fairly distributed from April through to November. Temperature distribution is uniform with mean monthly minimum of 23.4°C and maximum of 34.5°C. A minimum relative humidity of 46 % and maximum of 76.8 % is recorded for the area (SARI Annual Report, 2016).

Experimental Design and Treatments

The study was a 4 x 4 factorial experiment laid out in a Randomized Complete Block Design (RCBD) with three replications with spacing at 30 cm x 15 cm, 30 cm x 30 cm, 30 cm x 45 cm

and broadcast control (Farmer method) combined with topping at 4, 6, 8 weeks after planting (WAP) and no topping.

Sowing and cultural practices

The experimental field was ploughed, harrowed and demarcated appropriately. Beds were made and seeds sown on beds. Seeds with a germination percent of 90% were sown at three seeds per hill at a depth of 5 cm in different spacing dimensions: 30 x 15 cm, 30 x 30 cm and 30 x 45 cm, and by broadcasting. Seedling emergence was observed 3 days after sowing and 80 – 87 % emergence was recorded at 6 days after sowing.

Weeds were cleared manually from the experimental field at 2, 5 and 8 WAP. Insect pests infestation occurred and the common pests found were Cotton stainers (*Dysdercus superstitiosus*), Flea beetle (*Podagrica spp*) and Spiny bollworm (*Earis biplaga*). Pests were controlled at 2, 4 and 6 WAP by applying DIZ – LAMBDA 2.5 E C pesticide at the rate of 10.8 ml per 12.96 litres of water. NPK (15:15:15) fertilizer was applied at 225 g per 9 m² plot.

Data Collection

Five plants were randomly selected and tagged in each plot for data collection at 4, 6, and 8 WAP.

Data on plant height was taken with a tape measure from the base of the plant to the apical part of the plant using measuring tape. The number of branches and number of leaves per plant were counted manually. The number of days after planting at which 50% of the Roselle plants produced flowers per plot was recorded. Five mature fruits were randomly selected and harvested from each treatment, dried and threshed and the seeds counted per fruit. Mature fruits from 7.2 m² area from each plot were harvested, sun dried and threshed for 1000 seed determination with an electronic scale. For seed yield, mature fruits from 7.2 m² area from each plot were harvested, sun dried, threshed and weighed with electronic scale and the weight was extrapolated to obtain seed yield in kg/ha. Shoots were harvested from 7.2 m² area from each plot at harvest and cut separately into pieces and stored in separate paper envelopes for fresh shoot weight and subsequently dry weight (biomass) determination after oven drying at 105°C for 24 hours.

Data analysis

Data collected was subjected to Analysis of Variance (ANOVA) using GENSTAT (Teaching edition) software and the treatment means were separated using the least significant difference (LSD) test at 5 % significant level.

RESULTS AND DISCUSSION

Profitability of Landscaping in Tamale Metropolis

The first objective of the study is to evaluate profitability of landscape services in Tamale Metropolis. The cost of planting materials (which includes flower seeds, lawn grass and seedlings) accounted for the highest proportion of total cost of landscaping (27.7%) in the metropolis. This indicates the relevance of the source, availability and type of planting materials in landscaping. Depreciation on fixed assets used for landscaping such as watering can, wheel barrow, motor king, mower, shovel, hand trowel, garden line, measuring tape, hoe, cutlass, handfork, secateurs, water hose, rake, head pan, among others accounted for 14.5% of the total cost. Maintenance includes mowing, trimming, pest and disease control, weed control, manuring, training, pruning which accounted for 15.0% of the total landscaping cost. Site preparation includes site clearing, tilling, levelling, and digging holes which constituted 5.2% of total landscaping cost (Table 1).

Table 1: Marketing efficiency and benefit-cost ratio of landscaping business per annum in Tamale Metropolis

Item	Amount (GH ₵)	% share of total cost
Total revenue (A)	18,252	N/A
Cost		
Labour	1,850	20.0
Site preparation	480	5.2
Supply of black soil	1,440	15.6
Purchase of planting materials	2,560	27.7
Maintenance	1,380	15.0
Watering and raising flowers	180	2.0
Total variable cost (B)	1,890	N/A

Depreciation on equipment (C)	1,342	14.5
Total cost (D)	9,232	N/A
Gross margin (A – B)	10,362	N/A
Net income (A – D)	9,020	N/A
Marketing efficiency (A – D)/D	0.98	N/A
Benefit-cost ratio (A/D)	1.98	N/A

Source: Field Survey, 2016

Despite the high production cost per annum (GH₵ 9,232), landscape service providers had average annual net income of GH₵ 9,020. This net income is as a result of total revenue exceeding total cost of landscaping in the Metropolis. From the Table 1, below marketing efficiency is 0.98 (which is < 1) while the benefit-cost ratio is 1.98 (which is > 1). These indicate that, though inefficient, landscaping business in the study area is profitable. Therefore, a landscape servicer provider has some level of returns/income left out of the revenue generated from the landscaping business after all expenses/cost directly related to the generation of revenue (Table 1) are paid. On the other hand, inefficiency in landscaping business indicates that landscape service providers are in the state of not achieving maximum productivity; that is failure to make the best use of time or resources in landscape business. The revelation in this case is that landscape service providers in Tamale Metropolis lack the ability to do their landscaping business without wasting materials, time or energy. There is therefore the need to eliminate inefficiency in landscape business in the Metropolis.

3.2 Willingness to Pay (WTP) for landscape services in Tamale Metropolis

The second objective of the study is to evaluate willingness of commercial and domestic clients to pay for good (new) landscape services in Tamale Metropolis. After creating the hypothetical market, respondents were first asked to indicate their WTP more for landscape services before proceeding to ask those who were willing to pay more the amount they were willing to pay by allowing them to choose among a number of bids. From the field survey, willingness of respondents to pay more for landscape services in Tamale Metropolis was very high since 92.5% were willing to pay more. Major reason given by the few respondents (7.5%) for their

unwillingness to pay more for landscape services is that they cannot afford to pay for the services. On the other hand, major reason given by those who were willing to pay more for landscape services is their deep appreciation of the aesthetic value and environmental conservation functions.

To come out with the actual amounts respondents were willing to pay, those who were willing to pay more were further provided with 4 bids to choose from. The bids were GH₵350, GH₵500, GH₵650 and GH₵700 per 100 square metre. These bids were based on current amounts being charged by landscape service providers in Tamale Metropolis during the data collection period (August, 2016). During the field survey, respondents were asked a question like 'how much would you pay to establish a lawn/landscape in your house per 100 square metres (standard area for a front yard)'. During the field survey, GH₵500 served as start-up bid for WTP elicitation. If a respondent was unwilling to pay the initial bid (GH₵500), he/she was given a 2nd lower bid (GH₵350). The commercial/institutional and domestic clients may accept or reject this bid; and this leads to 2 possible responses: 'no-yes' or 'no-no.' 'No-yes' means the respondent is unwilling to pay GH₵500 for landscape services but is willing to pay a reduced amount, GH₵350. 'No-no' means the respondents (commercial/institutional and domestic clients) are unwilling to pay both the initial bid (GH₵500) and a reduced amount (GH₵350) for landscape services per 100 square metre. Though such respondents are willing to pay for landscape services, the bids provided for the study are perhaps too high for them. Thus, they would be willing to pay a further reduced amount (which would be lower than the amount being charged by landscape service providers during the data collection period, August, 2016).

On the other hand, if a respondent is willing to pay the initial bid (GH₵500), he/she is given a 2nd higher bid (GH₵650). Similarly, the respondent may accept or reject this bid; and this leads to 2 possible responses: 'yes-no' or 'yes-yes.' 'Yes-no' means the respondent is willing to pay the initial bid (GH₵500) but unwilling to pay a further increased amount (GH₵650). Hence, the maximum amount they are willing to pay is between GH₵500 and GH₵650. Also, 'yes-yes' is an indication that respondents are willing to pay both the initial bid and a further increased amount. Since the maximum amount such respondents are willing to pay exceeds GH₵650, they were further offered a higher bid (GH₵700) though very few were

willing to pay this higher bid. The results from this bidding process are presented in Table 2.

Table 2: Willingness of commercial and domestic clients to pay more for landscape services in Tamale Metropolis

Landscape service	WTP (%)			
	Yes-yes	*Yes-no*	*No-yes*	*No-no*
Commercial/institutional clients				
Establishment of new lawn	60	10	20	10
Lawn maintenance	50	10	10	30
Water fountain	40	0	20	40
Rock garden	50	10	10	30
Flower bed	60	0	30	10
Domestic/household clients				
Establishment of new lawn	30	22.5	22.5	25
Lawn maintenance	15	25	37.5	22.5
Water fountain	15	17.5	30	37.5
Rock garden	12.5	10	35	42.5
Flower bed	40	15	27.5	17.5

Source: Field survey, 2016

As reported in Table 2, more commercial/institutional clients are willing to pay for the higher bids for all the landscape services presented for the study than domestic/household clients. In practice, this is justifiable because commercial/institutional clients of landscape services are more likely to be highly financially resourced than domestic/household clients who are normally individuals. For instance, while more than half (60%) of commercial/institutional clients interviewed are willing to pay GH₵650 for establishment of new lawn on their premises, only 30% of domestic/household clients are willing to pay GH₵650 for the same services. Similarly, exactly half of commercial/institutional clients are willing to pay GH₵650 per 100 square metres per annum for lawn maintenance while only 15% of domestic clients are willing to pay this same amount for the maintenance of the lawns. Apart from resource constraint, most respondents were

of the view that maintaining the lawns themselves is a way of exercising their bodies and appreciating the beauty of the lawns.

Table 2 further indicates that more commercial/institutional clients are willing to pay higher bids (GH₵650) for the establishment of new lawns and flower bed preparation (60% each) and these are followed by lawn maintenance and rock garden (50% each). For domestic clients, flower bed had the highest number of respondent willing to pay GH₵650 for its establishment, which is followed by establishment of new lawns. Very few (less than 16% in each case) were willing to pay GH₵650 for lawn maintenance, water fountain or rock garden. Most of such respondents were rather willing to pay lower bids for these landscape services on their premises.

Water fountain had the highest number of commercial/institutional clients (40%) who were even willing to pay lower amount than the lowest bid offered for the study (GH₵350) while establishment of new lawn and flower beds had the least. For domestic/household clients of lawn services in Tamale Metropolis, rock garden had the highest number of people (42.5%) who were willing to pay lower amount than the lowest bid used for the study (GH₵350) and this is followed by water fountain (37.5%). Flower bed had the least number of domestic clients who were willing to pay lower than the lowest bid. The above findings on clients' WTP for landscape services are in sync with Schlapfer and Hanley (2003) who revealed that WTP for landscape features is fairly high.

3.3 Constraints of landscape business in Tamale Metropolis

The final objective of the study is to discover constraints of landscape business in Tamale Metropolis. As shown in Table 3, 8 constraints were mentioned and ranked by respondents during the field survey. Kendall's Coefficient of Concordance revealed that poor climatic conditions had the highest mean score (7.6) and this means that it was ranked as the most pressing constraint by respondents. Tamale Metropolis is geographically situated in Northern Ghana where there is low annual rainfall; high temperatures especially towards the end of the dry season; very low relative humidity; in addition to the long dry season which starts in November and ends in March/April within which there is harmatan winds (December to early

February) (GSS, 2013). The harsh climatic conditions in the region adversely affect vegetation, establishment of lawns, flower beds and other forms of landscape designs.

During the long drought, lawns and other forms of landscape should be strictly supplied with irrigation water to ensure that they constantly grow to beautify the environment. Meanwhile, there is inadequate water supply in the Metropolis since this was ranked 4th among the 8 constraints to landscape business in Tamale Metropolis. As a result, if very stringent care is not taken, most landscape designs that require the use of water especially lawns, water fountains and flower bed may entirely collapse or deteriorate or depreciate in value during the dry season (November to March/April).

Table 3: Constraints of landscape business in Tamale Metropolis

Constraint	Mean rank/score	Position/rank
Unfavourable climatic conditions	7.6	1st
Inadequate capital	7.0	2nd
Low public interest in landscape services	6.2	3rd
Inadequate water supply	4.4	4th
Poor maintenance culture	4.2	5th
Inadequate technical personnel	3.2	6th
Inadequate planting materials	2.2	7th
Pests and diseases	1.2	8th
Test Statistics		
Number of observations	100	
Kendall's W	0.874	
Chi-square	30.6	
Degree of freedom	7	
Asymptotic significance level	0.000	

W symbolizes Kendall's Coefficient of Concordance

Source: Field survey, 2016

Maintenance of these forms of landscape in the Metropolis during the drought would also come with massive cost. However, inadequate capital was cited as a chief constraint to landscape business in the Metropolis. From Table 3, inadequate capital had the second highest mean score and thus it was ranked 2nd most important constraint to landscape business in Tamale Metropolis. Like any other business, landscaping requires financial investment such as funds for acquiring and transporting planting materials, payment of landscape service providers and cost of maintaining established landscape. As a result, financial status of landscape clients is central in establishment and maintenance of landscape.

The above-mentioned constraints to landscape business (harsh climate, inadequate capital and water) among other factors have led to low public interest in landscape design in Tamale Metropolis. Thus, low public interest in landscaping their premises, be it individual households or commercial/institutions, was ranked 3rd among the constraints. Other landscaping constraints mentioned during the field survey are poor maintenance culture, inadequate technical personnel, inadequate planting materials as well as pests and disease infestations. Due to inadequate technical personnel for landscape development, some households or institutions may be willing to have a landscape but getting personnel for its establishment could be a challenge. Inadequate technical personnel may also lead to huge charges for landscape development. Again, inadequate technical personnel may lead to employment of the services of unskilled personnel for landscape development which could result in inferior and substandard landscaping (Asiedu *et al*., 2013). In addition, poor maintenance culture among landscape clients could lead to poor upkeep and care for established landscape and this will cause untimely deterioration and decline in value of established landscape.

The value for Kendall's Coefficient of Concordance (W) (0.874) indicates that 87.4% of respondents are in agreement with ranking of constraints that militate against landscape design in the Tamale Metropolis (Table 3). This implies that 87.4% of respondents have agreed that poor climatic condition is their topmost constraint, followed by inadequate capital, low public interest and the sequence

continuous (Table 3). Kendall Coefficient of 87.4% clearly implies a high degree of agreement among respondents for ranking the constraints.

CONCLUSIONS

Despite high production cost, landscape service providers have high net income. Though inefficient, the benefit-cost ratio showed that landscaping business in Tamale Metropolis is profitable. In general, willingness of landscape clients to pay more for landscape services is very high in the Metropolis. Since commercial/institutional clients of landscape services are more likely to be highly financially resourced, more commercial/institutional clients are willing to pay the higher bids for all landscape services presented for the study than domestic/household clients. Majority of commercial/institutional and domestic clients are willing to pay more for establishment of new lawn and flower bed. Among the constraints of landscape business, poor climatic condition was ranked as topmost, followed by inadequate capital and low public interest in landscape services. The study recommends that research institutions such as UDS, private agencies and Metropolitan Assembly should promote landscaping as a business in the Metropolis. Institutions and households should be educated on appropriate maintenance culture of established landscapes. Individuals seeking for entrepreneurial opportunities should also take full advantage of the existing demand for landscape services in the Metropolis.

RESEARCH LIMITATIONS

There were two principal limitation of the study. (1) Difficulty in getting respondents. Obtaining landscape clients and landscape service providers for the survey was problematic since most households in Tamale Metropolis actively do not do landscaping. This may be due to the cost of maintenance and the long dry season. (2). During the field survey, it was pretty difficult to explain to respondents the meaning of landscaping and its types. This made solicitation of information challenging.

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